United States Department of Agriculture
Natural Resources Conservation Service

NEW JERSEY AUDUBON SOCIETY

New Jersey Fact Sheet: Forest Stand Improvement for Wildlife

Introduction

New Jersey's forest ecosystems offer many economic, recreational, and ecological benefits, including timber resources, aesthetic value, improved air and water quality, and habitat for many plant and animal species. Almost 2 million acres in New Jersey, or about 42 percent of the state, are forested.

Prior to European settlement, the state was made up of more than 4.7 million acres of forested land. Disturbances such as wind storms, ice storms, wildfires, beaver flooding, agricultural production, and forestry operations maintained various habitats across the landscape, providing diverse resources for a wide range of species. Today, roughly 85 percent of the remaining forests are considered uniformly middle-aged, which can mainly be attributed to decreases in certain disturbance events. This change in habitat types has ultimately led to limited biodiversity. Wildlife habitat is further compromised when it is subjected to additional emerging stressors. Fortunately, the negative impacts of some of these trends can be reversed with a more proactive approach to enhancing wildlife habitat. Forest Stand Improvement (FSI) with a wildlife focus can be an excellent tool that can enhance the health of a forest ecosystem while improving habitat for wildlife.

Why Manage Forest Habitat for Wildlife?

Almost two thirds of New Jersey's forested land is privately owned, so maintaining diverse wildlife populations across the state will largely depend on private landowners interested in forest management and wildlife habitat. A comprehensive Forest Stewardship Plan (FSP) affords an opportunity for landowners to integrate wildlife habitat enhancements into the overall management of the property.

Healthy forests offer valuable resources to a variety of common and imperiled wildlife species (John Parke, NJA)

Wildlife habitat management has long been used to benefit game species; however, using similar tactics to enhance conditions for non-game species is gaining popularity, especially with resource managers. This approach is also used as a method to reverse population declines among a number of rare species and is particularly appealing when the habitat management benefits an entire suite of species. In many cases, traditional habitat management practices for game species require only slight changes in order to increase the suitability for particular non-game species.

Species that rely on forested uplands and wetlands include (from left to right) the bobwhite quail (NJA Archive), bobcat (©Gary Kramer, USFWS), and wood turtle (Kristen Meistrell, NJA).

Invasive and non-native plants, such as garlic mustard (left) (Suzanne Treyger, NJA), typically lead to limited structural complexity. Promoting vertical and horizontal growth (middle) (Don Donnelly, NJA) can help improve habitat for a variety of species, including wood thrush (right) (©Steve Maslowski, USFWS).

Management Options

A landowner interested in improving forest health while creating habitat for wildlife has a number of FSI options, depending on the existing conditions and the desired future outcome. Typical FSI techniques include:

- Selective cutting and felling of competitive vegetation
- Girdling select trees
- Herbicide application
- Prescribed burns

These techniques can increase forest health by reducing competition for resources and improving structural complexity. Favoring native species and those that are best suited to site conditions can also reinforce a forest's resiliency to environmental stress. Creating and improving wildlife habitat often has specific requirements and considerations, so it is important to consult with an approved forester or natural resource professional for guidance.

Specific Management Techniques for Improving Wildlife Habitat

There are four main resources that are necessary to the survival of all wildlife species:

- Source of food and nutrients
- Source of clean water
- Source of cover, shelter, and nesting sites
- Space large enough to satisfy life history and home range requirements

Good quality habitat incorporates a matrix of all four of these resources. Some general techniques that can enhance and build the quality of these resources include:

1. **Improve vegetative structure** by increasing the amount of sunlight that reaches the lower forest layers while promoting native regeneration. This can be achieved by creating small forest openings, which help create habitat for a variety of wildlife species.

2. **Protect wetland and riparian buffers** by preserving vegetation that stabilizes banks and shades the water. Minimizing the use of heavy machinery can also help protect these buffers, which are essential for slowing stormwater runoff, absorbing excess nutrients, and preventing erosion. Certain regulations and restrictions may apply to specific sites, so it is important to consult a natural resource professional for proper guidance. The New Jersey Forest Service's *NJ Forest and Wetlands Best Management Practices Manual* can also provide proper procedures and precautions to take when working in wetland and riparian habitats.

3. **Control invasive and non-native species** that outcompete, stress, or kill native species. Competition from invasive plants often results in decreased ecosystem health and reduced food and cover for wildlife. For non-native invasive plants, control can be achieved through mechanical

(From left to right) Vegetative buffers along riparian and wetland habitats (John Parke, NJA) are crucial for maintaining ecological integrity while improving water quality and reducing soil erosion. These vegetative buffers can also help improve habitat for a variety of common and rare wildlife, including the wood duck (©David Herr, US Forest Service), painted skimmer (©Mike Bisignano), and long-tailed salamander (Kristen Meistrell, NJA).

(From left to right) Maintaining a *soft edge* (Kristen Meistrell, NJA) between forests and open areas can help protect wildlife from threats, such as brown-headed cowbirds (leading to increased brood parasitism) (©David Herr, US Forest Service). In addition, creating structural complexity (Kristen Meistrell, NJA) can benefit a wide range of common and imperiled species, including the wild turkey (©Dean Elsen, US Forest Service).

removal and with herbicide applications. For invasive insect outbreaks, the best method of control is prevention; however, existing outbreaks may require extensive treatment, so it is important to consult an approved forester or natural resource professional for guidance on forest pests.

4. **Decrease *hard edge* habitat**, or habitat that abruptly changes from forest habitat to an open area. These habitat types have been found to attract certain predatory mammals, brood parasites, and large white-tailed deer populations, leading to decreases in desirable plant and animal species. Decreasing hard edge habitat can be achieved by maintaining the transitional area as a scrub-shrub ecosystem that includes both herbaceous plants and smaller woody plants such as shrubs and tree saplings.

5. **Promote mast-producing plants**, or plants that grow an edible fruit or nut that is used as food for wildlife. A forest landowner can help maximize food resources for a wide variety of insects, birds, mammals, and reptiles by maintaining a balance of soft mast plants (for berries and fruits) and hard mast plants (for nuts and acorns) that produce food during different times of the year.

6. **Retain or create snags** (standing dead trees) that provide both forage and cover for a wildlife. Dead trees typically harbor large insect populations, providing food for a variety of animals. Snags will also contain cavities that provide nesting and roosting sites for many wildlife species. Girdling select trees during forestry operations is the best way to create standing snags.

7. **Create brush piles, expose bare mineral soils, and leave woody debris on the ground.** Brush piles and downed logs or trees provide cover and forage for a variety of wildlife. In addition, scattered bare soil patches can provide dusting sites (used for dry bathing) and nesting sites for various wildlife species. During FSI operations, leave some downed trees that are undesirable for wood products on the forest floor. Create patches of disturbance to expose mineral soils and use downed branches and logs to create brush piles for wildlife.

In addition to the above FSI techniques, several other habitat-enhancing elements can be incorporated into an FSP. The creation of vernal pools can provide excellent habitat for many wildlife species. Nest boxes and artificial roosts can also be installed to provide resources for cavity-nesters and tree roosting species. Many wildlife habitat improvements often require specific conditions and considerations, so it is important to consult an approved forester or natural resource professional for guidance.

(From left to right) Mast-producing plants, such as winterberry holly (John Parke, NJA) provide forage for a variety of wildlife, including the eastern chipmunk (©David Herr, US Forest Service). In addition, retaining standing snags (Kristen Meistrell, NJA) can provide forage and nesting habitat for many species, such as the red-headed woodpecker (©Michael Hogan).

(From top left to top right) The barred owl (John Parke, NJA), long-tailed weasel (©Dennis Garrison, US Forest Service), blue-spotted salamander (©Mike Bisignano), (from bottom left to bottom right) prothonotary warbler (©Kevin Karlson), eastern kingsnake (Kristen Meistrell, NJA), and American black bear (©Steve Hillebrand, USFWS) are all additional species that inhabit forested uplands and wetlands.

Technical and Financial Assistance

An FSP that incorporates wildlife considerations into FSI practices will usually present the best options for wildlife enhancement and landowner goals. The landowner is typically responsible for the costs of development and implementation of a Forest Stewardship Plan. However, qualifying landowners in New Jersey have several options for obtaining technical and financial assistance for forest management.

The Natural Resources Conservation Service (NRCS) offers technical and financial assistance to forest landowners through the Environmental Quality Incentives Program (EQIP). Eligible landowners may receive cost-share assistance for the development of a Forest Stewardship Plan, or for costs related to site preparation, invasive plant removal, seedling protection, and fencing when part of an approved Forest Stewardship Plan. Forest Stewardship Plans cost-shared through EQIP must be prepared by an NRCS-approved Technical Service Provider (TSP). A list of TSPs can be found at a local NRCS service center or on the New Jersey NRCS website.

NRCS office locations and more detailed information about NRCS assistance and the EQIP program can be found at: www.nj.nrcs.usda.gov/

Additional NRCS fact sheets from this series on forest stewardship planning can be found at: http://www.njaudubon.org/default.aspx?tabid=2566

For More Information

General Information on NRCS Forestry Programs
www.nj.nrcs.usda.gov/technical/forestry/index.html

Information on NRCS EQIP Program
www.nj.nrcs.usda.gov/programs/eqip/forestry.html

Locating an NRCS TSP
http://techreg.usda.gov/CustLocateTSP.aspx

NJDEP Wildlife Habitat Management Information
http://www.state.nj.us/dep/fgw/habitat_mgt.htm

List of NJDEP-Approved Consulting Foresters
www.state.nj.us/dep/parksandforests/forest/ACF.pdf

NJ Forestry and Wetlands Best Management Practices Manual
www.state.nj/us/dep/parksandforests/forest/nj_bmp_manual1995.pdf